engineering fracture mechanics

List of Contents and Author Index
Volume 50, 1995

PERGAMON

engineering fracture mechanics

An International Journal

EDITOR-IN-CHIEF
PROFESSOR HAROLD LIEBOWITZ
c/o A.E.R.D.C.O.
P.O. Box 25736
Washington, DC 20007-8736, U.S.A.

EDITORIAL ADVISORY BOARD

PROFESSOR S. N. ATLURI
Georgia, U.S.A.

DR. ZDENEK BILEK
Brno, Czech Republic

PROFESSOR BRUNO A. BOLEY
New York, U.S.A.

DR. DAVID BROEK
Ohio, U.S.A.

PROFESSOR JANNE CARLSSON
Stockholm, Sweden

PROFESSOR G. P. CHEREPANOV
Florida, U.S.A.

PROFESSOR H. T. CORTEN
Illinois, U.S.A.

DR. THEODOR GAYMANN
Munich, Germany

DR. GEORGE T. HAHN
Tennessee, U.S.A.

PROFESSOR GEORGE HERRMANN
California, U.S.A.

PROFESSOR D. L. JONES
Washington, D.C., U.S.A.

PROFESSOR HIROSHI KIHARA
Tokyo, Japan

DR. J. M. KRAFFT
Virginia, U.S.A.

PROFESSOR JAMES D. LEE
Washington, D.C., U.S.A.

PROFESSOR FRANK A. McCLINTOCK
Massachusetts, U.S.A.

PROFESSOR A. J. McEVILY
Connecticut, U.S.A.

PROFESSOR JAROSLAV NEMEC
Prague, Czech Republic

DR. NICHOLAS PERRONE
Maryland, U.S.A.

DR. J. SCHIJVE
Delft, The Netherlands

DR. WALTER SCHUTZ
Ottobrunn, Germany

PROFESSOR GEORGE C. SIH
Pennsylvania, U.S.A.

PROFESSOR JANN N. YANG
California, U.S.A.

PROFESSOR TAKEO YOKOBORI
Utsunomiya, Japan

Production Editor: Zara Wilcock, Elsevier Science Ltd, The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, England (Tel (01865) 843000; Telex 83177; Fax (01865) 843010; e-mail z.wilcock@elsevier.co.uk).

Publishing, Subscription and Advertising Offices: Elsevier Science Ltd, The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, England; or Elsevier Science Inc., 660 White Plains Road, Tarrytown, NY 10591-5153, U.S.A.

Subscription Rates
Annual Institutional Subscription Rates 1995: North, Central and South America, U.S.$2124.00, rest of the world, £1425.00. Associated Personal Subscription Rates are available on request for those whose institutions are library subscribers. Sterling prices exclude VAT. Non-VAT registered customers in the European Community will be charged the appropriate VAT in addition to the price listed. Prices include postage and insurance and are subject to change without notice.
Second class postage paid at NEWARK NJ and additional Mailing Offices. Postmaster send address corrections to Engineering Fracture Mechanics, c/o Elsevier Science Inc., 660 White Plains Road, Tarrytown, NY 10591-5153, U.S.A.

Published Monthly plus Additional Issues in January, March, May, July, September and November (Three Volumes 1995). Subscription enquiries from customers in North America should be sent to Elsevier Science Inc., 660 White Plains Road, Tarrytown, NY 10591-5153, U.S.A. and for the remainder of the world to Elsevier Science Ltd, The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, England.

Back Issues of all previously published volumes, in both hard copy and on microform, are available direct from Elsevier Science offices.

Whilst every effort is made by the publishers and editorial board to see that no inaccurate or misleading data, opinion or statement appear in this journal, they wish to make it clear that the data and opinions appearing in the articles and advertisements herein are the sole responsibility of the contributor or advertiser concerned. Accordingly, the publishers, the editorial board and editors and their respective employees, officers and agents accept no responsibility or liability whatsoever for the consequences of any such inaccurate or misleading data, opinion or statement.

Copyright © 1995 Elsevier Science Ltd

The cover picture was taken by Dr Erwin Sommer in his studies at the Ernst Mach Institute in Freiburg, Germany, in work under the direction of Dr F. Kerkhof. Dr Sommer is Director of Fraunhofer-Institut Fuer Werkstoffmechanik, Rosastraße, 9, 7800 Freiburg, Germany.

List of Contents

NUMBER 1

V. G. DeGiorgi, P. Matic, I. Bar-On and **G. M. C. Lee**	1	An experimental and computational investigation of crack growth initiation in three-point bend fracture specimens
Y. Toi and **T. Kiyosue**	11	Damage mechanics models for brittle microcracking solids based on three-dimensional mesoscopic simulations
S. X. Gong	29	On the formation of near-tip microcracking and associated toughening effects
M. Farshad and **P. Flüeler**	41	Crack propagation in prestressed plates
D. Katsareas and **N. Anifantis**	51	Boundary element analysis of thermally stressed interface cracks
Huang Bo	61	Fundamental formulas of dynamic stress intensity factors of mode III for a propagating crack in a strip
G. P. Nikishkov	65	An algorithm and a computer program for the three-term asymptotic expansion of elastic–plastic crack tip stress and displacement fields
T. S. Srivatsan and **T. S. Sudarshan**	85	The high strain fatigue behavior of lead-containing copper alloys
Hsien-Yang Yeh and **Chang H. Kim**	103	Fracture mechanics of the angled elliptic crack under uniaxial tension
D. Radaj and **S. Zhang**	111	Process zone fracture criteria for crack tips
Ru-Min Chao and **Ming-Ying Rau**	121	Frictional contact of an arc crack in an isotropic homogeneous material due to uniaxial loading
Zhao Jun and **Zhang Xing**	131	The asymptotic study of fatigue crack growth based on damage mechanics
	I	Software Survey Section

NUMBER 2

Wang Qizhi	143	An analytical study of J-integral estimation formula for a straight-through cracked three-point bend round beam specimen
Weisheng Lei and **Bingsen Chen**	149	Fractal characterization of some fracture phenomena

K. B. Broberg	157	Critical review of some methods in nonlinear fracture mechanics
J. Chen and **S. Takezono**	165	The dislocation-free zone at a mode I crack tip
R. Moskovic	175	Analysis of fracture toughness data in the brittle to ductile transition region for Creusot–Loire A508 Class 3 forging used in the construction of PWR reactors
H. Schäbe and **R. Viertl**	203	An axiomatic approach to models of accelerated life testing
E. Z. Wang and **N. G. Shrive**	219	Variations of the effective elastic material properties of a brittle solid with distributed void propagation
E. P. Busso, D. W. Dean and **D. Linkens**	231	On the effects of loading conditions and geometry on time-dependent singular crack tip fields
Yi-Heng Chen and **N. Hasebe**	249	Investigation of EEF properties for a crack in a plane orthotropic elastic solid with purely imaginary characteristic roots
G. S. Wang	261	An EPFM analysis of crack initiation, stable growth and instability
Yi-Heng Chen and **N. Hasebe**	283	Investigation of main–micro crack interaction problems in a unidirectional fibre reinforced composite
		Technical Notes
J. T. Evans, G. Kotsikos and **R. F. Robey**	295	A method for fracture toughness testing cylinder material
C. D. Liu, M. N. Bassim and **S. St. Lawrence**	301	Dependence of the fatigue limit of rail steels on stress intensity factor near inclusions
D. Radaj and **S. Zhang**	309	Fracture initiation outside the slit tip
	I	Software Survey Section

NUMBER 3

Dong-Shan Fu and **Xing Zhang**	311	Analytical–variational method of solution for stress intensity factors about anisotropic and isotropic finite plates with double cracks emanating from holes
Dong-Shan Fu and **Xing Zhang**	325	Analytical–variational method of analysis about a finite plate with a cracked hole stiffened by a ring with rivet joints

S. K. Verma, P. Kumar, N. N. Kishore and **P. K. Kesavan Potty**	345	Evaluation of critical interlaminar SIF of DCB specimen made of slender cantilever
Y. Z. Chen	355	Weight function for an internal crack in plane elasticity
K. P. Herrmann and **R. Wang**	361	Interaction of an antiplane shear crack with a transforming inclusion
S. J. Chu and **C. T. Sun**	369	Energy release rate for a dynamically growing crack at the interface of dissimilar isotropic materials
R. Kumar and **K. Singh**	377	Influence of stress ratio on fatigue crack growth in mild steel
N.-A. Noda, T. Yamasaki, K. Matsuo and **Y. Takase**	385	Interaction between fillet and crack in round and flat test specimens
		Technical Notes
A. Greasley	407	Influence of residual welding stresses, overload and specimen preparation on fatigue crack growth under axial compression
Xu Kewei, Hu Naisai and **Zhou Huijiu**	417	Prediction on fatigue limit of notches with non-propagating crack
		Discussion
G. O. Rading	423	"Application of a new model for fatigue threshold in a structural steel weldment", by Bartosiewicz *et al.*

NUMBER 4

H. Schäbe	425	Influence of different using loads on the spread of lifetime
Z. M. Xiao, M. K. Lim and **K. M. Liew**	431	Stress intensity factors of two internal elliptical cracks in three-dimensional solid
Z.-J. Lu, P. J. Nicholas and **W. J. Evans**	443	Calibration of an ACPD monitoring system for small crack growth in corner crack specimens
S. Chandrakanth and **P. C. Pandey**	457	An isotropic damage model for ductile material
A. J. Dentsoras and **E. P. Kouvaritakis**	467	Effects of vibration frequency on fatigue crack propagation of a polymer at resonance
Kang Yong Lee and **Sang-Joon Park**	475	Thermal stress intensity factors for partially insulated interface crack under uniform heat flow
X.-L. Zheng, B. Lü and **H. Jiang**	483	Determination of probability distribution of fatigue strength and expressions of P–S–N curves

S. Bhattacharya and **A. N. Kumar**	493	Rotational factor using bending moment approach under elasto-plastic situation—I. Notch 3PB geometry
A. N. Kumar and **S. Bhattacharya**	507	Rotational factor using bending moment approach under elasto-plastic situation—II. Crack 3PB geometry
Y. Kaji, K. Kikuchi and **A. T. Yokobori, Jr**	519	Estimation of creep fracture life for Hastelloy XR by Q^* parameter
Heping Xie and **D. J. Sanderson**	529	Fractal kinematics of crack propagation in geo-materials
J. X. Zhang, Y. W. Shi and **M. J. Tu**	537	Factors affecting the estimation of fracture mechanics parameters of center-cracked weldment
F. P. Brennan and **W. D. Dover**	545	Stress intensity factors for threaded connections
G. De Roeck and **M. M. Abdel Wahab**	569	Strain energy release rate formulae for 3D finite element
		Technical Note
R. Jukes and **J. Vogwell**	581	A method for establishing geometry correction factors by ratio of finite element stresses
	I	Software Survey Section

NUMBER 5/6

	591	Preface
H. Liebowitz	595	Knowledge-based modeling of fracture of materials and structures
J. Liebowitz	601	Expert systems: a short introduction
Kung-Yan Lee and **H. Liebowitz**	609	An expert system in fracture mechanics
F. C. M. Menandro, E. T. Moyer, Jr and **H. Liebowitz**	631	An expert system approach to fracture mechanics
H. Liebowitz, J. S. Sandhu, F. C. M. Menandro and **J. D. Lee**	639	Smart computational fracture of materials and structures
H. Liebowitz, J. S. Sandhu, J. D. Lee and **F. C. M. Menandro**	653	Computational fracture mechanics: research and application

C. K. Lee and **S. H. Lo**	671	An automatic adaptive refinement procedure using triangular and quadrilateral meshes
S. K. Choudhary and **I. R. Grosse**	687	Effective stress-based finite element error estimation for composite bodies
F. C. M. Menandro, E. T. Moyer, Jr and **H. Liebowitz**	703	A near optimal crack tip mesh
F. C. M. Menandro, E. T. Moyer, Jr and **H. Liebowitz**	713	A methodology for crack tip mesh design
J. S. Sandhu, F. C. M. Menandro, H. Liebowitz and **E. T. Moyer, Jr**	727	Hierarchical mesh adaptation of 2D quadrilateral elements
J. S. Sandhu and **H. Liebowitz**	737	Mesh adaptation using a four-noded quadrilateral plate bending element
W. W. Tworzydlo and **J. T. Oden**	759	Knowledge-based methods and smart algorithms in computational mechanics
A. K. Noor, W. S. Burton and **J. M. Peters**	801	Hierarchical adaptive modeling of structural sandwiches and multilayered composite panels
R. Löhner	819	Mesh adaptation in fluid mechanics
P. M. Haefele and **J. D. Lee**	849	Combination of finite element analysis and analytical crack tip solution for mixed mode fracture
P. M. Haefele and **J. D. Lee**	869	The constant stress term
M. E. Pachajoa, M. K. Frances and **J. D. Lee**	883	Stress and failure analysis of composite structures
Chee-Kiong Soh and **J. C. Miles**	903	A framework for integrating databases with knowledge bases for structural engineering
M. A. Issa, S. Tsui and **A. Yousif**	923	Application of knowledge-based expert systems for rating highway bridges
J. L. Chen, S. H. Sun and **W. C. Hwang**	935	An intelligent data base system for composite material selection in structural design
J. S. Sandhu and **H. Liebowitz**	947	Examples of adaptive FEA in plasticity
	I	Software Survey Section